

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A lens barrel assembly having a movable lens disposed in a lens barrel for movement along an optical axis, an actuating mechanism for moving said movable lens along the optical axis, and control means for controlling said actuating mechanism,

wherein said actuating mechanism has an externally threaded member extending parallel to said optical axis, a motor for rotating said externally threaded member, an internally threaded member nonrotatably threaded over said externally threaded member for movement along said externally threaded member into abutment against said movable lens in response to rotation of said externally threaded member, and urging means for urging said movable lens in the longitudinal direction of said externally threaded member to move into abutment against said internally threaded member;

said lens barrel assembly further comprising position detecting means for detecting a position of said movable lens along the optical axis and generating positional data corresponding to the detected data; and

wherein said control means comprises a ~~first~~ controller for controlling an angular displacement of said motor in order to equalize the position of said movable lens along the optical axis to a target position based on said positional data supplied from said position detecting means, ~~and~~

wherein a second said controller for judging that said movable lens is forcibly stopped against movement and immediately ~~de-energizing~~ energizes said motor if said positional data remains unchanged for a predetermined period of time while said motor is in rotation, and

wherein said controller establishes said positional data when said motor is de-energized as a reference position for a distance over which said movable lens is to move along the optical axis or a position to which said movable lens is to move along the optical axis.

2. (Currently amended) A lens barrel assembly having a movable lens disposed in a lens barrel for movement along an optical axis, said movable lens being nonrotatable about said optical axis, an actuating mechanism for moving said movable lens along the optical axis, and control means for controlling said actuating mechanism,

wherein said actuating mechanism has an internally threaded member mounted on said movable lens, an externally threaded member threaded in said internally threaded member and extending parallel to the optical axis, a motor for rotating said externally threaded member, and urging means for urging said movable lens in the longitudinal direction of said externally threaded member;

said lens barrel assembly further comprising position detecting means for detecting a position of said movable lens along the optical axis and generating positional data corresponding to the detected data; and

wherein said control means comprises a ~~first~~ controller for controlling an angular displacement of said motor in order to equalize the position of said movable lens along the optical axis to a target position based on said positional data supplied from said position detecting means, ~~and~~

wherein said ~~a second~~ controller for judg~~esing~~ that said movable lens is forcibly stopped against movement and immediately de-energizing-energizes said motor if said positional data remains unchanged for a predetermined period of time while said motor is in rotation-, and

wherein said controller establishes said positional data when said motor is de-energized as a reference position for a distance over which said movable lens is to move along the optical axis or a position to which said movable lens is to move along the optical axis.

3. (Canceled)

4. (Original) The lens barrel assembly according to claim 1 or 2, further comprising:

a guiding mechanism disposed in said lens barrel for guiding said movable lens along the optical axis, said guiding mechanism having a guide shaft extending along the optical axis and engaging in a bearing on said movable lens for guiding said movable lens along the optical axis, said urging means including a helical spring coiled around said guide shaft and having an end resiliently held against said bearing and the other end resiliently held against said lens barrel.

5. (Currently amended) An image capturing apparatus including a lens barrel assembly having a movable lens disposed in a lens barrel for movement along an optical axis, an actuating mechanism for moving said movable lens along the optical axis, and control means for controlling said actuating mechanism,

wherein said actuating mechanism has an externally threaded member extending parallel to said optical axis, a motor for rotating said externally threaded member, an internally threaded member nonrotatably threaded over said externally threaded member for movement along said externally threaded member into abutment against said movable lens in response to rotation of said externally threaded member, and urging means for urging said movable lens in the longitudinal direction of said externally threaded member to move into abutment against said internally threaded member;

said lens barrel assembly further comprising position detecting means for detecting a position of said movable lens along the optical axis and generating positional data corresponding to the detected data; and

wherein said control means comprises a ~~first~~ controller for controlling an angular displacement of said motor in order to equalize the position of said movable lens along the optical axis to a target position based on said positional data supplied from said position detecting means, ~~and~~

wherein said a second controller for judging that said movable lens is forcibly stopped against movement and immediately ~~de-energizing~~ energizes said motor if said positional data remains unchanged for a predetermined period of time while said motor is in rotation, and

wherein said controller establishes said positional data when said motor is de-energized as a reference position for a distance over which said movable lens is to move along the optical axis or a position to which said movable lens is to move along the optical axis.

6. (Currently amended) An image capturing apparatus including a lens barrel assembly having a movable lens disposed in a lens barrel for movement along an optical axis, said movable lens being nonrotatable about said optical axis, an actuating mechanism for moving said movable lens along the optical axis, and control means for controlling said actuating mechanism,

wherein said actuating mechanism has an internally threaded member mounted on said movable lens, an externally threaded member threaded in said internally threaded member and extending parallel to the optical axis, a motor for rotating said externally threaded member, and urging means for urging said movable lens in the longitudinal direction of said externally threaded member;

said lens barrel assembly further comprising position detecting means for detecting a position of said movable lens along the optical axis and generating positional data corresponding to the detected data; and

wherein said control means comprises a ~~first~~ controller for controlling an angular displacement of said motor in order to equalize the position of said movable lens along the optical axis to a target position based on said positional data supplied from said position detecting means, ~~and~~

wherein said ~~a second~~ controller for judg~~esing~~ that said movable lens is forcibly stopped against movement and immediately ~~de-energizing~~ energizes said motor if said positional data remains unchanged for a predetermined period of time while said motor is in rotation, ~~and~~

wherein said controller establishes said positional data when said motor is de-energized as a reference position for a distance over which said movable lens is to move

along the optical axis or a position to which said movable lens is to move along the optical axis.

7. (New) The lens barrel assembly according to claim 1,

wherein said actuating mechanism has a second externally threaded member extending parallel to said optical axis, a second motor for rotating said second externally threaded member, a second internally threaded member nonrotatably threaded over said second externally threaded member for movement along said second externally threaded member into abutment against a second movable lens in response to rotation of said second externally threaded member, and a second urging means for urging said second movable lens in the longitudinal direction of said second externally threaded member to move into abutment against said second internally threaded member;

said lens barrel assembly further comprising a second position detecting means for detecting a position of said second movable lens along the optical axis and generating second positional data corresponding to a second detected data; and

wherein said control means comprises a controller for controlling an angular displacement of said second motors in order to equalize the second position of said second movable lens along the optical axis to a second target position based on said second positional data supplied from said second position detecting means, and

wherein said controller judges that said second movable lens is forcibly stopped against movement and immediately de-energizes said second motor if said second positional data remains unchanged for a predetermined period of time while said second motor is in rotation.

8. (New) The lens barrel assembly according to claim 2,

wherein said actuating mechanism has a second internally threaded member mounted on a second movable lens, a second externally threaded member threaded in said second internally threaded member and extending parallel to the optical axis, a

second motor for rotating said second externally threaded member, and a second urging means for urging said second movable lens in the longitudinal direction of said second externally threaded member;

said lens barrel assembly further comprising a second position detecting means for detecting a second position of said second movable lens along the optical axis and generating second positional data corresponding to a second detected data; and

wherein said control means comprises a controller for controlling an angular displacement of said second motor in order to equalize the second position of said second movable lens along the optical axis to a second target position based on said second positional data supplied from said second position detecting means,

wherein said controller judges that said second movable lens is forcibly stopped against movement and immediately de-energizes said second motor if said second positional data remains unchanged for a predetermined period of time while said second motor is in rotation, and

wherein said controller establishes said second positional data when said second motor is de-energized as a second reference position for a distance over which said second movable lens is to move along the optical axis or a second position to which said second movable lens is to move along the optical axis.

9. (New) The image capturing apparatus according to claim 5,

wherein said actuating mechanism has a second externally threaded member extending parallel to said optical axis, a second motor for rotating said second externally threaded member, a second internally threaded member nonrotatably threaded over said second externally threaded member for movement along said second externally threaded member into abutment against a second movable lens in response to rotation of said second externally threaded member, and a second urging means for urging said second movable lens in the longitudinal direction of said second externally threaded member to move into abutment against said second internally threaded member;

said lens barrel assembly further comprising a second position detecting means

for detecting a second position of said second movable lens along the optical axis and generating second positional data corresponding to a second detected data; and

wherein said control means comprises a controller for controlling an angular displacement of said second motor in order to equalize the second position of said second movable lens along the optical axis to a second target position based on said second positional data supplied from said second position detecting means, and

wherein said controller judges that said second movable lens frames is forcibly stopped against movement and immediately de-energizes said second motor if said second positional data remains unchanged for a predetermined period of time while said second motor is in rotation.

10. (New) The image capturing apparatus according to claim 6,

wherein said actuating mechanism has a second internally threaded member mounted on a second movable lens, a second externally threaded member threaded in said second internally threaded member and extending parallel to the optical axis, a second motor for rotating said second externally threaded member, and a second urging means for urging said second movable lens in the longitudinal direction of said second externally threaded member;

said lens barrel assembly further comprising a second position detecting means for detecting a second position of said first movable lens along the optical axis and generating a second positional data corresponding to a second detected data; and

wherein said control means comprises a controller for controlling an angular displacement of said second motor in order to equalize the position of said second movable lens along the optical axis to a second target position based on said second positional data supplied from said second position detecting means, and

wherein said controller judges that said second movable lens is forcibly stopped against movement and immediately de-energizes said second motor if said second positional data remains unchanged for a predetermined period of time while said second motor is in rotation.

11. (New) The lens barrel assembly according to claim 7,

wherein said controller establishes said second positional data when said second motor is de-energized as a second reference position for a distance over which said second movable lens is to move along the optical axis or a second position to which said second movable lens is to move along the optical axis.

12. (New) The lens barrel assembly according to claim 7, further comprising:

a second guiding mechanism disposed in said lens barrel for guiding said second movable lens along the optical axis, said second guiding mechanism having a second guide shaft extending along the optical axis and engaging in a second bearing on said second movable lens for guiding said second movable lens along the optical axis, said second urging means including a second helical spring coiled around said second guide shaft and having an end resiliently held against said second bearing and the other end resiliently held against said lens barrel.

13. (New) The lens barrel assembly according to claim 8, further comprising:

a second guiding mechanism disposed in said lens barrel for guiding said second movable lens along the optical axis, said second guiding mechanism having a second guide shaft extending along the optical axis and engaging in a second bearing on said second movable lens for guiding said second movable lens along the optical axis, said second urging means including a second helical spring coiled around said second guide shaft and having an end resiliently held against said second bearing and the other end resiliently held against said lens barrel.